

REMARKS

Claims 1, 3-5, 7-15, 17-19, and 21-26 are pending. Claims 13, 14, 15, 17-19 and 21-26 are withdrawn from consideration. Claims 1, 3-5, 7-15, 17-19, and 21-26 remain in the case.

In response to applicant's prior response, the examiner has maintained the rejection of claims 1, 3-5, 8,10 and 12 based on Aida *et al.* (EP 0 405 982) in view of Funayama *et al.* (US 5,128,286) and Koizumi *et al.* (US 6,491,992) used as an evidentiary reference.

The examiner relies upon Aida as teaching

a thermoplastic resin which incorporates inorganic filler, flame retardant agent (page 1, lines 3-8), glass fiber (reinforcing fibers) (page 5, lines 23-25) and a cross linking agent in an amount of 0.01-7 parts per weight per 100 parts of the thermoplastic polymer composition (claim 2). Aida *et al.* teach that the resin is cross linked by a heat treatment (claim 1). Aida teaches that the inorganic fiber is subjected to a surface treatment with a crosslinking agent prior to being added to the composition (page 5, lines 25-30). Finally Aida *et al.* teach the resin can be molded into various shapes (page 3 lines 26-30).

Funayama is added only in the rejections of claims 4 as "teach[ing] a cross linking agent which has a main skeleton which comprises an N element containing cyclic compound, this is the borazine cross linking agent shown as compound (iii) (column 7 lines 5-18)" and in the rejection of claim 15 as teaching "that the R4 components of the borazine may be hydrogens or alkenyl groups." Koizumi *et al.* is added as teaching that "cross linking agents are known in the art to improve dispersibility in rubbery substances (column 4 lines 65-67), which would include the cross linking agents disclosed in Funayama *et al.*"

As noted in applicant's prior response, the crux of the examiner's rejection is found in paragraph 13 of the Action (emphasis added):

As stated above Aida *et al.* and Funayama *et al.* teach the molded articles of applicant's invention however they are silent regarding adsorbing the crosslinking agents onto an inorganic

filler. However as all aspects of the invention are taught (*i.e.* the inorganic fillers and crosslinking agents) and as stated above Aida *et al.* teach that the inorganic filler undergoes a surface treatment with a crosslinking agent to increase dispersibility (page 5 lines 25-30) it must necessarily be so that some of, if not all of the crosslinking agent would be adsorbed onto the inorganic filler.

However, Aida never teaches or suggests the inorganic filler undergoes a surface treatment with a crosslinking agent. Aida does NOT teach that the inorganic filler is subjected to a surface treatment with a crosslinking agent. Aida teaches that the organic fiber is subjected to a surface treatment with a silane coupling agent, an organic titanate-based coupling agent, or a metallic salt of a fatty acid. The crosslinking agent in Aida is one or more of a dihydroaromatic series compound (C), ether series compound (D), tetrahydroaromatic series compound (E) or cyclopentane series compound (F). The surface treatment in Aida used one of a silane coupling agent, an organic titanate-based coupling agent, or a metallic salt of a fatty acid ("For the improvement of dispersibility, these fillers may be subjected to a surface treatment using, for example, a silane coupling agent., an organic titanate-based coupling agent, or a metallic salt of a fatty acid."). ***The inorganic fiber is not subjected to a surface treatment with the dihydroaromatic series compound (C), ether series compound (D), or tetrahydroaromatic series compound (E) or cyclopentane series compound (F), i.e., one of the crosslinking agents, but rather with a silane coupling agent, an organic titanate-based coupling agent, or a metallic salt of a fatty acid.*** Therefore Aida does not teach that its inorganic filler is treated with its crosslinking agent.

Furthermore, Aida does NOT teach that the inorganic filler is subjected to a surface treatment with a crosslinking agent such that it is "previously adsorbed on the inorganic filler." **as recited in all of applicant's claims.** In the examples that do include filler, Aida discloses that "Thermoplastic resins (A), rubbery substances (B), *inorganic fillers (H), crosslinking agents (C), (D), (E), (F), and polyfunctional monomers (G) were mixed together.*" Thus Aida does not suggest the any of the crosslinking agents "is previously adsorbed on the inorganic filler" as recited in all of applicant's claims. On both of these bases, no *prima facie* case of obviousness exists.

Funayama is added only in the context of several of the dependent claims, namely claims 4 and 15, where it is cited as disclosing the particular crosslinking agent recited in those claims. The examiner urges that it would have been obvious to one of ordinary skill in the art at the time of the invention "to modify the invention of Aida *et al.* with that of Funayama *et al.*" A skilled artisan would only substitute one crosslinking agent for another. Therefore, the skilled artisan only would substitute a crosslinking agent in Funayama for the dihydroaromatic series compound (C), ether series compound (D), tetrahydroaromatic series compound (E) or cyclopentane series compound (F) of Aida. Since the crosslinking agents and the inorganic filler are added concurrently in Aida, the substituted crosslinking agent still would not be previously adsorbed on the inorganic filler after the proposed modification. The only thing that is previously reacted with the filler is the silane coupling agent, organic titanate-based coupling agent, or metallic salt of a fatty acid, not the crosslinking agent.

Based on comments in an Advisory Action, the examiner seems to have misapprehended applicant's arguments. The examiner says that applicant states that crosslinking agents can be coupling agents. He has failed to appreciate that applicant's argument was that, although the same compound that functions for surface treatment to improve dispersibility in Aida might function as a crosslinking agent in another mixture, how the compound actually functions depends entirely on the other ingredients in the mixture. The examiner has equated the term "coupling agent" in Aida with the term "crosslinking agent," based on this statement by applicant, when this is not what applicant said.

As noted previously, while compounds disclosed as coupling agents in Aida can function to crosslink two moieties, this depends on their exact chemical structure and on the chemical structure of the other moieties. For clarity, applicant emphasizes that there is nothing in Aida itself to suggest that any of a silane coupling agent, an organic titanate-based coupling agent, or a metallic salt of a fatty acid ever functions as a crosslinking agent in any context, let alone in Aida's mixture. The observation that these compounds might function in this capacity in other mixtures comes only from applicant.

In any event, it is only how these compounds function in Aida that is of moment in the context of the present obviousness rejection. And in Aida's context it is clear that the silane coupling agent, organic titanate-based coupling agent, and a metallic salt of a fatty acid clearly do not function as crosslinking agents.

Thus, while applicant observed that one or more of Aida's coupling agents might function to crosslink two moieties *in other contexts, i.e., when the mixture contains moieties that are crosslinkable by such compounds*, applicant further noted that it is abundantly clear from Aida's disclosure that such moieties are not present in Aida's mixture and that the silane coupling agent, organic titanate-based coupling agent, or metallic salt of a fatty acid therefore *do not function as crosslinking agents in the context of Aida*. Instead their chemical structure and those of the other ingredients in Aida are such that they do NOT crosslink anything. The disclosure in Aida which makes this clear is the fact that the coupling agent in Aida is used in a surface treatment on the inorganic fillers in Aida to improve the dispersibility of the inorganic fillers, *i.e.*, to prevent the inorganic fillers from aggregating. Therefore, its purpose is not to crosslink anything. In fact, were it to cross link the organic fillers (or anything else in the mixture) its purpose of improving dispersibility would be completely defeated! Things that are crosslinked can no longer be dispersed. This is clear from the cited portion of Aida above. The coupling agent in Aida does not crosslink anything, and there is no teaching or suggestion in Aida that supports such an interpretation. To the contrary, the teaching in Aida that the coupling agent improves dispersibility of the fillers runs entirely counter to the examiner's interpretation.

Aida is very clear as to the types of compounds which crosslink the thermoplastic resin (A) and/or a rubbery substance (B) in their mixture. Those compounds are one or more of a dihydroaromatic series compound (C), ether series compound (D), tetrahydroaromatic series compound (E) and cyclopentane series compound (F). Such compounds do not include a silane coupling agent, an organic titanate-based coupling agent, or a metallic salt of a fatty acid. The latter compounds are only disclosed as being possible agents to improve dispersibility of the inorganic filler (which, it is again

emphasized, is added concurrently with the other components, so that there is no previous adsorption of a crosslinking agent on the inorganic filler).

In the Advisory Action the examiner further urges that "one of ordinary skill in the art at the time of the invention would realize that any clumping effect that may be present and due to crosslinking agents would occur during the crosslinking process, and not when just mixed within a dispersion." But it is abundantly clear from Aida's disclosure that the silane coupling agent, organic titanate-based coupling agent, or metallic salt of a fatty acid in Aida do not in fact function as crosslinking agents in Aida. Instead the skilled artisan would recognize that their chemical structure and those of the other ingredients in Aida are such that they do NOT crosslink anything. As explained in more detail above, while a compound disclosed as a coupling agent might function in a particular context to crosslink two moieties, this depends on their exact chemical structure and on the chemical structure of the other moieties.

Based on the foregoing, the examiner's argument that Aida *et al.* teach that the inorganic filler undergoes a surface treatment with a crosslinking agent to increase dispersibility (page 5 lines 25-30) and that it must necessarily be so that some of, if not all of the crosslinking agent would be adsorbed onto the inorganic filler is without merit.

The examiner further notes that it would have been obvious to make the substitution because "the invention of Aida *et al.* which offers a molded product that is superior in moldability without loss of mechanical strength (page 3, lines 17-22) would benefit from the boron compounds which improves mechanical strength at high temperatures (column 3, lines 5-10)." However, the boron compounds improve mechanical strength by crosslinking a silazane. It would not have been obvious to improve mechanical strength in Aida by substituting a crosslinking agent for Aida's coupling agent, since that would be contrary to Aida's purpose of improving dispersibility. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984), or if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then

the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). See also MPEP 2143. Modifying Aida by substituting a crosslinking agent in place of the coupling agent would make Aida unsatisfactory for its intended purpose of improving dispersibility, and change its principle of operation.

Koizumi is cited as evidence that crosslinking agents improve dispersibility in rubbery substances. The whole paragraph, including the portion (column 5, Lines 1-3) following the portion indicated by the examiner (Column 4, Lines 65-67) describes:

Further, a reinforcement, filler, softening agent, crosslinking agent, age resister, processing aid and the like which are generally blended to improve the dispersibility, heat resistance and the like of the rubber composition and for other purposes may be suitably blended into the rubber composition forming the dispersion phase.

That is, Koizumi discloses several substances which can be added, to achieve various effects. For some of them, their purpose is apparent from their name, *e.g.*, reinforcement, filler, softening agent, crosslinking agent, age resistor. Koizumi also lists other parameters, such as "improving dispersibility, heat resistance, and the like" which can be achieved by additives. There is no one-to-one correspondence stated or implied, *i.e.*, a skilled artisan would not understand that each of the additives listed improved dispersibility and heat resistance. In particular, a skilled artisan would not understand a crosslinking agent to improve dispersibility for the reasons detailed above, namely that a crosslinking agent would aggregate components of a mixture in a fixed relationship rather than improve their dispersibility. Accordingly, the reference Koizumi does not teach a skilled artisan that a "crosslinking agent" improves dispersibility.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aida *et al.* (EP 405 982) in view of Funayama *et al.* (US 5,128,286) as applied to claim 1 above and in further view of Marzocchi (3,888,645). Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aida *et al.* (EP 405 982) in view of Funayama *et al.* (US 5,128,286) as applied to claim 1 above and in further view Usuki *et al.* (US 4,889,885). Claim 11 is

rejected under 35 U.S.C. 103(a) as being unpatentable over Aida *et al.* (EP 405 982) in view of Funayama *et al.* (US 5,128,286) as applied to claim 1 above and in further view Tanaka *et al.* (JP 11-180990). None of the additional references cited in these rejections overcome the failure of Aida and Funayama to suggest a resin molded article that results from molding and solidifying a resin composition containing a thermoplastic polymer, a crosslinking agent for the thermoplastic polymer comprising at least one trifunctional crosslinking agent comprising a polyfunctional monomer or oligomer containing an unsaturated group in ends of the major skeleton, an inorganic filler, and a reinforcing fiber, and then crosslinking the thermoplastic polymer by heating or irradiation, with the content of the crosslinking agent being from 0.5 to 10 parts by weight based on 100 parts by weight of said thermoplastic polymer, wherein the crosslinking agent is previously adsorbed on the inorganic filler, based on the foregoing explanation. In particular, the art would not have suggested that a crosslinking agent for a thermoplastic polymer should be previously adsorbed on an inorganic filler in a resin molded article as presently claimed.

If there are any problems with this response, or if the examiner believes that a telephone interview would advance the prosecution of the present application, Applicant's attorney would appreciate a telephone call. In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,

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